Forest Health Protection
Pacific Southwest Region

Date: September 15, 2011
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To: District Ranger, Goosenest Ranger District, Klamath National Forest

Subject: Evaluation of bark beetle activity in the Goosenest LSR Thinning (FHP Report N11-10)

At the request of Sam Solano, District Silviculturist, a field evaluation of pine plantations near Juanita Lake in the Goosenest LSR was conducted on June 2, 2011. The objectives were to assess the current stand conditions and evaluate the project for potential funding through the Forest Health Protection Western Bark Beetle Initiative. Roger Siemers, Sam Solano and Ann Mileck (Klamath NF) attended with Cynthia Snyder and Pete Angwin (FHP).

Background

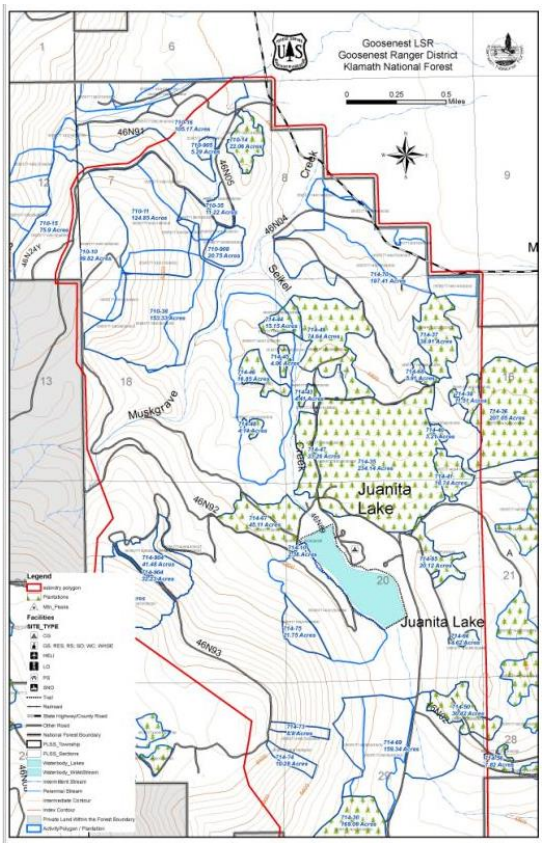

Figure 1. Goosenest LSR Plantations Thinning Project map.

The 224 acre Goosenest LSR Project area (Figure 1) is located in the Prather and Muskgrave (7th Field) Watersheds along the southeast edge of the 39,770 acre Goosenest LSR. This LSR is described as a narrow band of montane forest bounded to the east and west by unforested Shasta and Butte Valleys situated in the northernmost portion of the California Cascades (T46N, R2W, Mt. Diablo Meridian, Sections 7, 8, 17-20, 30, and 31-33), four miles west of the town of Macdoel, CA. The Goosenest LSR encompasses a large proportion of the forested habitat within the California Cascades north of Mount Shasta providing a critical link in metapopulation structure of northern spotted owl (NSO), a significant aspect of regional habitat planning and management.

Elevation ranges between 4,400 to 6,800 feet in the LSR. Average annual precipitation varies from 10 to 35 inches depending on elevation. Most precipitation occurs as snow between October and May, with occasional

NORTHERN CALIFORNIA SHARED SERVICE AREA
3644 AVTECH PARKWAY, REDDING, CA 96002
(530) 226-2637

Cynthia Snyder
clsnyder@fs.fed.us

Pete Angwin
pangwin@fs.fed.us

summer thundershowers. The north-south orientation of the California Cascades acts to create a rainshadow effect resulting in reduced precipitation on the eastern portion of the Goosenest LSR. The Klamath River canyon and Little Shasta drainage allow passage of moisture-bearing weather systems into the northern and southern portions of the LSR.

Within the Goosenest LSR is Juanita Lake (Figure 2), a popular destination for camping and fishing along the Highway 97 corridor linking Weed, CA and Klamath Falls, OR. The 54-acre lake provides excellent fishing opportunities for brown and rainbow trout (regularly stocked), bass, and catfish. Bald eagles and osprey utilize the lake for foraging. Approximately 19,000 people visit (day use or camp) annually making it the Forest's most heavily used campground. Juanita Lake is also unique in the Klamath NF because it has a current Vegetation Management Plan (2005) that Forest Health Protection helped craft. This vegetation management plan mentions the presence of western dwarf mistletoe in the large old ponderosa pines surrounding the lake and interspersed throughout the campground as well as the risk of bark beetle mortality.

Figure 2. The Juanita Lake Vegetation Management Plan specifies the protection of large ponderosa pine from bark beetle-caused mortality as an important factor.

Most of the stands in the Goosenest LSR Habitat Restoration EA are dense, young to mid-aged, with only a few small patches of remnant large, old trees (Figure 3). Although the area provides habitat for northern spotted owl and bald eagle, the habitat is in poor condition. During the period from 1909 to 1926, the majority of the project area was logged. Currently, the area is dominated by mid-successional stands, 60 to 80 years old, and lack structural diversity, especially large trees. Only 107 of the 2,226 acres proposed for treatment in the original Goosenest LSR EA are classified as late-successional vegetation.

Figure 3. Dense mid-aged pine plantation at high risk of bark beetle-caused mortality.

The purpose of the Goosenest LSR Habitat Restoration is to reduce fuels and develop desired stand characteristics to meet LSR objectives. The project is intended to improve vegetation conditions and watershed function in Riparian Reserves. The recommended

action in the Goosenest LSR NEPA proposes habitat restoration on 2,226 acres in a Late Successional Reserve. Direction in the Forest Plan states that LSRs are to be managed to protect and enhance conditions of late-successional forest ecosystems, which serve as habitat for many late-successional-related species including the northern spotted owl and the bald eagle. The purpose and need is to reduce fuels and develop desired stand characteristics to meet LSR objectives and to improve vegetation conditions and watershed function in Riparian Reserves.

Observations

The 224 acre project includes commercial and non-commercial thinning to maintain late successional habitat while reducing the dual risks of insect/disease mortality and wildfire. NEPA is complete on all of the stands in the project area (Goosenest Late Successional Reserve, Southeast Habitat Restoration Environmental Assessment August 29, 2005).

Figure 4. Mountain pine beetle galleries in dead ponderosa pine near plantation Juanita Lake.

There is evidence of current western pine beetle (*Dendroctonus brevicomis*) and mountain pine beetle (*D. ponderosae*) activity with scattered pockets of mortality (Figure 4) and possible Jeffrey pine beetle (*D. jeffreyi*) in scattered Jeffrey pine mixed with ponderosa pine. Pine engraver beetles (*Ips emarginatus*) were also found in dead and dying ponderosa pine. White fir is also experiencing mortality (Figure 5) due primarily to off-site position being attacked by flatheaded fir borer (*Melanophila drummondi*) picking off trees infected by Heterobasidion root disease (*Heterobasidion occidentali*). Stands are in an overstocked, high hazard condition in terms of their susceptibility to future successful bark beetle attacks (BA approximately 120-180 ft2/ac) with many large (10-28 inch DBH) trees in the overstory. There is also western dwarf mistletoe (*Arceuthobium campylopodum*) on ponderosa pine. Although evidence of infection is low outside of the campground, it is unlikely to be eliminated from the area and is an added stressor on pines already suited to western pine beetle attack.

Figure 5. Ponderosa pine and Jeffrey pine mortality due to Dendroctonus bark beetles.

Under the proposed action, treatment prescriptions would generally include thinning from below with variable spacing to reduce ladder fuels, reduce tree density, reduce competition between overstory trees, and promote future structural variability within stands. Prescribed underburning, mastication,

hand-piling and burning, and piling with tractor will be used to treat fuels on the ground (both existing and those that will be generated during restoration activities) would follow. Patches of Heterobasidion-infected white fir trees will be cut out of the stands. The small openings created from cutting the patches will be replanted with ponderosa pine and Douglas-fir.

Discussion

The Goosenest LSR Plantation Thinning Project area has experienced relatively modest tree mortality since 2010, despite overstocked stand conditions. This can be partially attributed to these stands containing non-host species such as Douglas-fir. However, it is very likely that western pine beetle and mountain pine beetle pressure will increase from existing populations within these stands resulting in higher levels of pine mortality. Of particular concern is the large diameter ponderosa pine scattered throughout the area especially near Juanita Lake.

There is currently an opportunity to significantly reduce the amount of susceptible pine within the stands, reduce overall stand density to a sustainable level, increase species diversity and meet other management objectives such as restoring habitat for wildlife and promoting conditions that will further these stands toward late successional status.

Currently, Northern California is experiencing higher than normal precipitation including snowpack levels. This has had a dramatic effect of reducing bark beetle mortality in stands with endemic bark beetle populations. Without project implementation, there exists a high probability that these stands will be significantly impacted by both mountain pine beetle and western pine beetle caused tree mortality when drought conditions resume in Northern California.

Summary

The proposed treatments, if fully implemented, will be effective in addressing concerns regarding bark beetles, fire and drought, and will meet the Regional Forester's density management policy that high risk density levels will not be reached again for at least 20 years. I fully support the treatments as described.

If you have any questions regarding this report and/or need additional information please contact Cynthia Snyder at 530-226-2437 or Pete Angwin at 530-226-2436.

/s/ Cynthia Snyder
Cynthia Snyder
Entomologist
Northern CA Shared Service Area

CC: Sam Solano, Mike Reed, Roger Siemers, Ann Mileck, Pete Angwin, Sheri Smith, Julie Lydick and Phil Cannon

Table 1 Supporting Details Table

Supporting Details	
Forest Type	Late Successional Reserve
Location	Southeast corner of Goosenest LSR near Juanita Lake Recreation Area
Risk Map	Moderate to high risk for bark beetle mortality
Watershed Classification	Muskgrave Seventh Field Watershed.
Landscape Treatment	Thinning
Proposed Treatment	Thin at varied spacing to promote structural diversity. Natural seeded species within the stand will remain to provide species diversity.
NEPA	Goosenest LSR Southeast Habitat Restoration (August 29, 2005)
Proposed Acres	224
Requested Funding	$33,600
Total Cost Per Acre	$150
Matching Funding	none
Species Composition	Primarily PP with some WF, IC, SP, Oak
Current Diameters	Average DBH 7.2”
Residual Diameters	Will target 9”to 11” class.
Current Stocking	303 TPA 12’X12” spacing
Target Stocking	134 TPA 18’X18’ average spacing
Agents of Concern	Dendroctonus and Ips beetles, wood borers, dwarf mistletoe, Heterobasidion root disease
Recent Activity	PP mortality by mountain and western pine beetle, Ips emarginatus, flatheaded fir borer, Heterobasidion root disease, western dwarf mistletoe
Current Susceptibility	High due to overstocking